明　細　書

発明の名称
　パケット交換における呼再設定方式

特許請求の範囲
　パケット交換される呼を認識できる呼識別子と着側装置番号とを呼設定パケットのユーティリティとして設定する機能と、ネットワーク内の一部の局間で呼再設定を行う場合に呼識別子と着側装置番号と呼再設定前までにパケットに付与されていたパケットシーケンス番号とをユーティリティとして設定する機能とを備え、通信中にネットワーク内に回線障害が生じてもネットワークに収容されている加入者には呼が切れたことを通知することなく回線障害の生じた一部の局間で呼再設定を行うことを特徴とするパケット交換における呼再設定方式。

発明の詳細な説明

〔産業上の利用分野〕
　本発明はパケット交換における呼再設定方式に関する。
〔従来の技術〕
　従来、パケット交換機においては、途中で呼が切れたらもう一度初めから呼設定してデータを再送している。
〔発明が解決しようとする課題〕
　上述した従来の方式では、回線障害が生じたら呼を切断してしまい全く新しい呼を設定してデータを再送しているため、呼切断及び呼設定の手順が増えて遅延時間が大きく、かつ内容の同一データの再送について交換機は関与していないため、どこまでデータが送られているのかどこから再送すれば良いのかわからない問題がある。
〔課題を解決するための手段〕
　本発明のパケット交換における呼再設定方式はパケット交換される呼を認識できる呼識別子と着側装置番号とを呼設定パケットのユーティリティとして設定する機能と、ネットワーク内の一部の

局間で呼再設定を行う場合に呼識別子と着側装置番号と呼再設定前までにパケットに付与されていたパケットシーケンス番号とをユーティリティとして設定する機能とを備え、通信中にネットワーク内に回線障害が生じてもネットワークに収容されている加入者には呼が切れたことを通知することなく回線障害の生じた一部の局間で呼再設定を行う構成である。

〔作用〕

本発明のパケット交換における呼再設定方式においては、予め接続完了パケット中に呼再設定情報ユーティリティを有し、着側装置番号及び呼識別子を付加する。局間の回線障害などで通信ができなくなった場合、予め迂回ルートを決めておき、その局間のみで呼再接続を行い、その発呼要求パケットと接続完了パケットのネットワークユーティリティ部に通信していた着側装置番号、呼識別子、送信パケットシーケンス番号及び受信パケットシーケンス番号を設定し、これらの情報に基づいて続きからデータを送信する。

〔実施例〕

次に、本発明について図面を参照して説明する。

本発明の一実施例を示す第1図、第2図及び第3図を参照すると、X・25回線から発呼要求パケット1を受信したパケット交換機（交換局）PS1はこのパケットをパケット交換機PS2、PS4へ送出するとき、呼識別子を必ず付与しなければならない。この呼識別子と着側装置番号とを予め接続完了パケット3のネットワークユーティリティ部に付与する。通常、パケット交換機PS1-PS2-PS4のルートをデータが伝送中にパケット交換機PS2-PS4間で回線障害が起き、データ（6）はシーケンス番号（1,0）まで発信端末PT1から着信端末PT2に送られている。そのため、パケット交換機PS2-PS4間で呼再設定を行い、予め定められた迂回ルートPS2-PS3-PS4を設定する。この呼再設定の発呼要求パケット1と接続完了パケット3とのネットワークユーティリティ部にこれま

で通信していた呼識別子、着側装置番号、送信パケットシーケンス番号（1）及び受信パケットシーケンス番号（0）をのせ、これらの情報によりデータ（7）はパケット交換機PS2からシーケンス番号（2,0）で送ることができる。なお、第1図において、2は着呼パケット、4は着呼受付パケット、5,6,7,8,9はそれぞれ送信,受信パケットシーケンス番号（0,0）、（1,0）、（2,0）、（3,0）、（4,0）のデータである。また、第2図及び第3図に示す呼再設定情報ユーティリティにおいてオクテット0はパラメータレングスである。

〔発明の効果〕

以上説明したように本発明によれば、回線障害時に障害の生じたパケット交換局間のみで呼再設定することにより、呼が切断しても全く新しい呼を設定してデータを再送するという動作に伴う遅延時間を短縮できる。また、交換局が全て行うため、端末相互間では正常通信を継続できる。
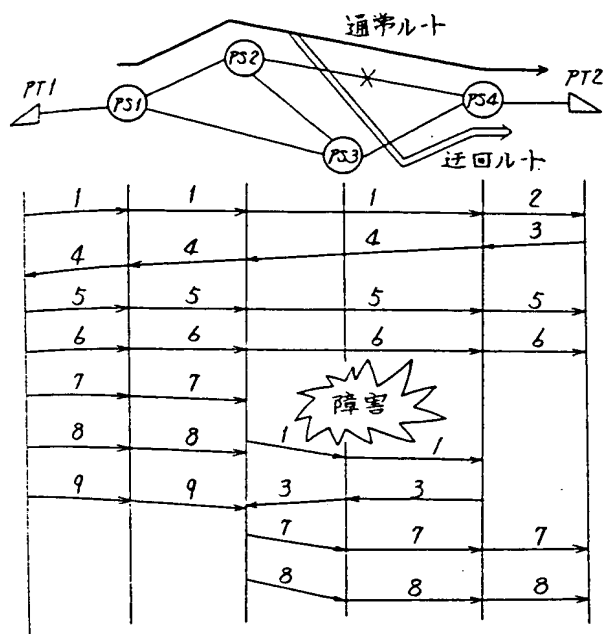
図面の簡単な説明

第1図は本発明の一実施例における動作シーケンスを示す図、第2図及び第3図は同実施例におけるパケットの呼再設定情報ユーティリティを示す図である。

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第 1 図

第 2 図

第 3 図

JAPANESE PATENT APPLICATION, FIRST PUBLICATION NO. H2-186743

TITLE	Call Resetting System for Packet Switching
APPLICATION NO.	H1-6204
FILING DATE	January 13, 1989
APPLICANT(S)	NEC ENGINEERING, LTD.
INVENTOR(S)	Rieko SAKUMA

CLAIM

A call resetting system for packet switching provided with a function of setting as a utility of a call setting packet a receiving side device number and call identifier enabling the identification of a call to be packet-switched; and a function of setting as a utility the call identifier, the receiving side device number and a packet sequence number provided to the packet before call reset when call reset is performed between some of the stations in a network; characterized in that when a channel failure occurs in the network during transmissions, a call is reset between the stations in which the channel failure has occurred without notifying subscribers accommodated within the network that a call has been cut off.

DETAILED DESCRIPTION OF THE INVENTION

Field of Industrial Application

The present invention relates to a call resetting system for packet switching.

Prior Art

Conventionally, when a call is abruptly cut off in a packet switching device, the data is

retransmitted by setting up the call once again from the beginning.

Problems to be Resolved by the Invention

When a channel failure occurs in the above-described conventional system, the call is severed and an absolutely new call is set to retransmit the data, so that the call severance and call setting procedures increase to make the delay time longer, and since the switching device does not contribute to the retransmission of data having identical content, it is not possible to know how much of the data has been transmitted and where to commence retransmission.

Means for Resolving the Problems

The call resetting system for packet switching of the present invention is provided with a function of setting as a utility of a call setting packet a receiving side device number and call identifier enabling the identification of a call to be packet-switched; and a function of setting as a utility the call identifier, the receiving side device number and a packet sequence number provided to the packet before call reset when call reset is performed between some of the stations in a network; characterized in that when a channel failure occurs in the network during transmissions, a call is reset between the stations in which the channel failure has occurred without notifying subscribers accommodated within the network that a call has been cut off.

Functions

In the call resetting system for packet switching according to the present invention, a call resetting information utility is provided in a connection complete packet beforehand, and a receiving side device number and call identifier are appended.   When transmissions become impossible due to channel failures or the like between stations, a detour route is predetermined, and call reconnection is performed only between those stations, the receiving side device number, call identifier, transmission packet sequence number and reception packet sequence number transmitted to the network utility portion of the call requesting packet and connection complete packet are set, and data are transmitted in continuation based on this information.

Embodiments

Next, the present invention shall be described with reference to the drawings.

With reference to Fig. 1, Fig. 2 and Fig. 3 which show an embodiment of the present invention, the packet switching device (exchange station) PS1 which received the call request packet 1 from the X25 channel sends this packet out to the packet switching devices PS 2 and PS4, it must always append a call identifier.   this call identifier and receiving side device number are provided beforehand in the network utility portion of the connection complete packet 3.   Normally, a channel failure occurs between packet

switching devices PS2-PS4 during transmission of data on the route of packet switching devices PS1-PS2-PS4, and data (6) is sent from the call issuing terminal PT1 to the call receiving terminal PT2 until the sequence number (1, 0).   For this reason, call resetting is performed between the packet switching devices PS2-PS4, and a predetermined detour route PS2-PS3-PS4 is established.   The network utility portion of the call request packet 1 and connection complete packet 3 of the call reset are provided with the call identifier, receiving side device number, transmission packet sequence number (1) and reception packet sequence number (0) transmitted until then, and the data (7) can be sent from the packet switching device PS2 with the sequence number (2, 0) in accordance with this information.   In Fig. 1, 2 denotes a received call packet, 4 denotes a received call acceptance packet, and 5, 6, 7, 8 and 9 respectively denote data of transmission and reception packet sequence numbers (0, 0), (1, 0), (2, 0), (3, 0) and (4, 0).   Additionally, the octet 0 in the call resetting information utility shown in Figs. 2 and 3 is a parameter length.

Effects of the Invention

As described above, when a channel failure occurs, the present invention allows the delay time for the operation of retransmitting data by setting up an absolutely new call to be shortened even when a call is severed, by resetting calls only between the packet exchange stations in which the failure occurred.   Additionally, since the switching station performs everything, normal communications can be continued between the terminals.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a drawing showing the operational sequence in an embodiment of the present invention; and Figs. 2 and 3 denote drawings of call resetting information utilities of a packet in the same embodiment.

(54) HIGH SPEED COMMUNICATION METHOD OF INTER-PROCESSOR
(11) 2-186741 (A)   (43) 23.7.1990   (19) JP
(21) Appl. No. 64-4978   (22) 13.1.1989
(71) HITACHI LTD   (72) KEISUKE OKAJIMA(1)
(51) Int. Cl⁵. H04L12/48

PURPOSE: To realize high speed communication and to improve transfer capacity by giving storage destination addresses in a reception processor to respective cells and automatically storing communication information to a memory in accordance with the addresses in the reception processor.

CONSTITUTION: Information to be communicated is written into the memory 120 in the processor 110. Furthermore, the leading address of communication information is written into a memory read circuit 154 in a cell resolution device 150, the number of transfer words into a word counter 151, storage address absolute/relative display and the storage destination address into a storage destination address register 152, and a header into a header register 153 in the processor 110. The circuit 154 reads specified words from the designated leading address from the memory 120 and transfers it to a message register 130. When the cell completes, the register 130 is synchronized with a buffer register 140, the completed cell is transmitted to a vacant time slot, and the cell concerned is transmitted to a reception module 300.

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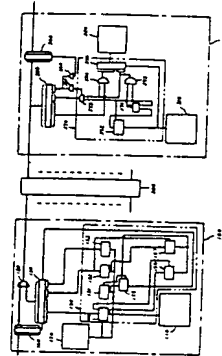
(54) ELECTRONIC TERMINAL SYSTEM
(11) 2-186742 (A)   (43) 23.7.1990   (19) JP
(21) Appl. No. 64-6396   (22) 12.1.1989
(71) CANON INC   (72) HIROYUKI UEDA
(51) Int. Cl⁵. H04L12/54,H04L12/58,H04L29/12

PURPOSE: To obtain an inexpensive and modern electronic mail terminal equipment having a high additional value, which has used an electronic typewriter and a telephone set, by permitting a timer means to automatically access the mail box of an electronic mail center.

CONSTITUTION: The terminal of a subscriber L3 at Los Angeles (L.A.) can be connected to the electronic mail center E-Mail Center in Los Angeles, and the mail box which is exclusively used by the subscriber L3 is allocated on the magnetic disk of a computer device, for example. It is assumed that a subscriber N2 in New York (N.Y.) sends a letter to the subscriber L3 in L.A. The letter is transmitted from the terminal of the subscriber N2 to the E-mail center of N.Y., and is stored in a mail box MBX-L3 in the center of L.A. via a line (NETWORK). The subscriber in L.A. accesses MBX from the terminal L3, and it is printed in the terminal so as to obtain a content on a paper.

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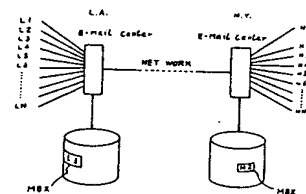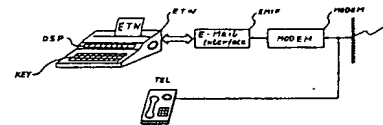
(54) CALL RESETTING SYSTEM IN PACKET EXCHANGE
(11) 2-186743 (A)   (43) 23.7.1990   (19) JP
(21) Appl. No. 64-6204   (22) 13.1.1989
(71) NEC ENG LTD   (72) RIEKO SAKUMA
(51) Int. Cl⁵. H04L12/56

PURPOSE: To shorten a delay time following an operation which is to set a totally new cell even if the call is disconnected and to retraensmit data·by resetting the call only between packet exchanges where a fault has occurred at the time of the fault of a line.

CONSTITUTION: A call identifier and a terminating-side device number are previously given to the network utility part of a connection complement packet 3. The fault of the line has occurred between the packet exchanges PS2 and PS4, and data (6) is transmitted from an originating terminal PT 1 to a transmitting terminal PT 2 till sequence number (1, 0). Then, the call resetting is executed between the PS2 and the PS-4, and the alternative route PS2-PS3-PS-4 is set. The call identifier, the terminating-side device number, the transmission packet sequence number (1) and the reception packet sequence number (0), all of which are made communication, are inputted to the network utility part of the call request packets 1 and 3 for resetting the call, and data (7) can be transmitted from PS2 by the sequence number (0, 2).
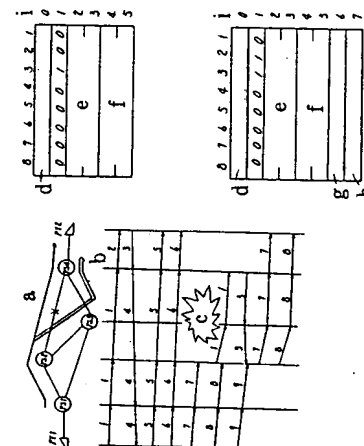
a: normal route. b: alternative route. c: fault. d: utility code. e: terminating-side device number. f: call identifier. g: transmission packet sequence number. h: reception packet sequence number